

# Researchers discover new way to determine cancer risk of chemicals

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A new study has shown that it is possible to predict long-term cancer risk from a chemical exposure by measuring the short-term effects of that same exposure. The findings, which currently appear in the journal *PLOS ONE*, will make it possible to develop simpler and cheaper tests to screen chemicals for their potential cancer causing risk.

Despite an overall decrease in incidence of and mortality from cancer, about 40 percent of Americans will be diagnosed with the disease in their lifetime, and around 20 percent will die of it. Currently fewer than two percent of the chemicals on the market have been tested for their ability to induce cancer.

Using an experimental model, researchers from Boston University School of Medicine (BUSM), Boston University School of Public Health, the BU Bioinformatics Program and the National Toxicology Program at the National Institute of Environmental Health measured the effects on healthy tissue from few days of exposure to a given chemical and assessed the effects on the gene expression response in the liver. "By comparing the responses to known chemical carcinogens and non-carcinogens, we were able to extract a "signature" and an associated predictive model capable of discriminating with high accuracy between the two," explained corresponding author Stefano Monti, PhD, associate professor of medicine at BUSM and a member of the BU Superfund Research Program. "Furthermore, by inspection of the coordinated set of genes driving the response to chemical exposure, we were able to zoom in to the potential mechanisms driving cancer induction," he

added.

According to the researchers there is growing recognition that the role played by environmental pollutants in human [cancer](#) is under-studied and that more formal approaches to the analysis of the biological consequences of prolonged exposure to pollutants are needed. "This work has confirmed that it is possible to predict the long-term [cancer risk](#) by measuring the short term effects," said Monti. "As a result of our findings we expect that accurate and cost-effective screening for evaluating the carcinogenic potential of the more than the 80,000 chemicals currently in commercial use soon will be a reality."

Provided by Boston University Medical Center

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